


**Ring network for sharing protection resource by working communications paths**

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**Abstract**

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In a ring topology network, a number of nodes interconnect transmission links to form first and second working rings and first and second optical protection rings in a ring topology. Multiple working paths are established on each working ring and multiple protection paths are established on each protection ring corresponding to the working paths. A first working path spans across first and second nodes for transmission of a signal in a first direction of the ring topology, and a second working path of the second working ring spans across the first and second nodes for transmission of a signal in a second direction of the ring topology opposite to the first direction. A first protection path on the first protection ring spans across the first and second nodes for transmission of a signal in the second direction of the ring topology, and a second protection path of the second protection ring spans across the first and second nodes for transmission of a signal in the first direction of the ring topology. The first and second nodes normally use the first and second working paths, respectively. Responsive to a failure of one of the first and second working paths, the first and second nodes use a corresponding one of the first and second protection

paths, instead of the failed working path. 

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